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(21) Application number: **11099989**(22) Date of filing: **07.04.99**(71) Applicant: **DENSO CORP**

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(54) **SEMICONDUCTOR SUBSTRATE,
 MANUFACTURE THEREOF, AND
 MANUFACTURING APPARATUS THEREOF**

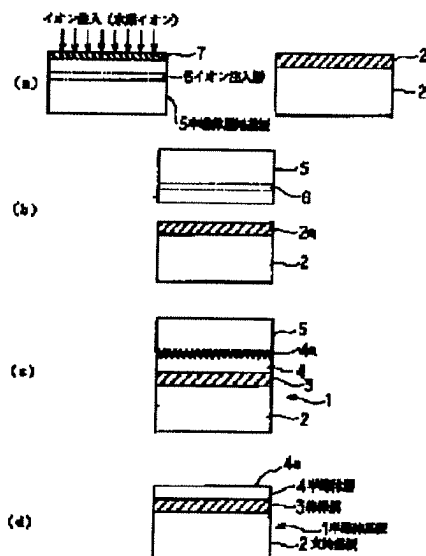
a satisfactory flattening process step is
 implemented.

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(57) Abstract:

PROBLEM TO BE SOLVED: To flatten a stripped surface without deteriorating uniformity in the film thickness of a stripped semiconductor layer in a substrate stripping technology involving ion implantation.

SOLUTION: When an SOI substrate 1 is processed using a substrate stripping technology wherein both an ion-implanted substrate 5 having an ion-implanted layer 6 formed therein and a support substrate 2 having a surface oxide film 2a formed thereon, which will become a buried oxide film 3 of the substrate 1, are subjected to a heat treatment in a laminated state, a stripped surface 4a of an SOI layer 4 formed by stripping is flattened, using an etching action performed by hydrogen. Particularly, by controlling the heat treatment temperature and atmospheric gas after the stripping,



<p>2001-106016/12 L03 NPDE 1999.04.07 NIPPONDENSO CO LTD 1999.04.07 1999-099989(+1999JP-099989) (2000.10.20) H01L 27/12, 21/265, 21/3065 Manufacturing silicon-on-insulated substrate, involves removing injection bonded on support substrate, by heat treating ion implantation layer C2001-031687</p>	<p>L(4-C2B, 4-C16)</p> <p>For manufacturing silicon-on-insulated (SOI) substrate.</p> <p><u>ADVANTAGE</u> The surface of SOI layer after removing injection substrate, is flattened without affecting film thickness uniformly of SOI layer.</p> <p><u>DESCRIPTION OF DRAWING</u> The figure shows the sectional view of manufacturing method of semiconductor substrate. Support substrate 2 Surface oxide film 2a SOI layer 4 Surface 4a Injection substrate 5 Ion implantation layer 6</p>
<p><u>NOVELTY</u> Ion implantation layer (6) is formed at preset depth from surface of injection substrate (5) using He, H, Ar. The injection substrate surface beside layer (6) is bonded to support substrate (2) having surface oxide film (2a). Substrate (5) is removed by heat treating the layer (6), resulting in formation of SOI layer (4). Surface (4a) of SOI layer is flattened by heat treating it or entire substrate (2).</p> <p><u>DETAILED DESCRIPTION</u> INDEPENDENT CLAIMS are also included for the following: (a) manufacturing apparatus of semiconductor substrate; (b) semiconductor substrate</p> <p><u>USE</u></p>	<p>JP 2000294754-A+</p>

